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ABSTRACT

This paper deals with the use of microteaching techniques to train student teachers in stimulating learners' questions. Research was carried out at the Gordon Teachers Training College, Haifa, Israel. A rating scale, including teaching patterns stimulating learners' questions, was prepared from the existing literature and the analysis of pilot micro-lessons. Twenty student teachers taught four micro-lessons each to seventh grade pupils; ten of them were supervised as a group, the others individually. The results show that microteaching helped student teachers acquire behavior stimulating learners' questions, and that group supervision was most effective to this end. A 17-item bibliography is included. (Author)

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THE USE OF MICROTEACHING TECHNIQUES TO TRAIN STUDENT-TEACHERS IN STIMULATING LEARNERS' QUESTIONS

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THE USE OF MICROTEACHING TECHNIQUES TO TRAIN STUDENT-TEACHERS IN STIMULATING LEARNERS' QUESTIONS

Arye Perlberg and Lya Kremer

I. INTRODUCTION.

The teacher training models which are presently used and the research designs evaluating the effectiveness of teaching and teacher training, have not led to the attainment of expected objectives resulting in general dissatisfaction with them. According to Gage (1968), one possible reason for this dissatisfaction is the global criterion approach to research in teaching and teacher training effectiveness which have proved to be sterile and fruitless. Gage has stated that "one solution within the criterion of effectiveness approach may be the development of the notion of micro-effectiveness". He claims further that "rather than seek criteria for the over all effectiveness of teachers ... we may have better success with criteria of effectiveness in small specifically defined aspects of the role".

The general purpose of this study was to investigate the effectiveness of micro-teaching in changing student-teachers' teaching behaviors. The advantage of micro-teaching lies in its ability to focus on teaching processes as well defined components, that may be analyzed, taught, practiced, predicted, controlled and evaluated. (Allen & Ryan, 1969; Borg, 1970; Perlberg, A , et al. 1970 and 1972). Secondly, the trainee benefits from various sources of feedback. He receives the most accurate picture of his teaching through the aid of video tape recorders and gets evaluative feedback from his supervisor, peers, and pupils. Thus microteaching overcomes certain deficiencies existing in the usual model of teacher-training practice teaching, namely, lack of immediate feedback and the improbability of reteaching the same subjects under identical conditions. Since we do not know whether the feedback the student-teacher receives has any influence on his teaching behavior and since an extensive period may pass until the student-teacher is in the same learning situation in which he may use the specific reinforced behavior, this last deficiency in the traditional model remains a detrimental one. An additional asset of the microteaching technique is that the feedback received is not only a matter of accurate protocol of his behavior, but a form of psychological self-confrontation which reduces the use of self-defense mechanisms so often used in regular supervisory processes.

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The specific teaching behavior selected for practice was the stimulation of learners to ask questions, preferably of high order level. School teaching, today, is based to a great extent on teachers' questions. The teacher's role appears to be one of asking questions on material he himself knows well, whereas the role of the pupil is to answer those questions which the teacher deems important and interesting. Various taxonomies for the clssification of teachers' questions have been developed in recent years. Ashner (1961) made a distinction between memory, reasoning, creative thinking and evaluative questions. Carner (1963) distinguished between questions asked to activate concrete thinking, abstract thinking and creative thinking; whereas Clements (1964) classified questions by their intent to stimulate memory, planning and evaluation of products. Pate and Bremer (1967) developed their classification according to product criteria: concept analysis and principles of divergent thinking. It is generally agreed that teachers' questions are an important factor in fostering pupils' thinking, but not a sufficient one. Teachers should also stimulate their students and elicit questions from them. Questions asked by pupils are evidence of their interest in the subject. Questions are on one hand a product of thinking and on the other hand a stimulus for further thinking. Austin (1949) was puzzled by the fact that children ask fewer questions the moment they enter school. Might this not be a result of a teacher behavior which discourages asking questions, or because of the fact that the teacher pursues the role of asking rather than answering? Pupils' questions, especially high order and unexpected ones, which require elaborate discussions, increase the conflict within the teacher who is already under pressure to keep up with the curriculum.

Dodl (1970) made a survey of teachers' questions versus pupils' questions in the classroom: "of a total of 43,531 behavior incidences recorded during this study, only 728 were pupil questions", which amounts to only 1.67% of the total number behavior incidences. The questions asked by the pupils were of routine nature, required clarification of the material presented or more information. No high-order questions were reported.

Gall (1971) who reviewed the research on the use of questions in teaching concluded that "research findings consistently show that students have only a very limited opportunity to raise questions". Moreover the problem is not only of providing

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opportunities to ask questions but that of training pupils in question-asking skills and it seems that this has been a neglected feature of classroom learning.

In today's world, computers and other technical aids are taking over to a certain extent the task of routine problem solving. The ability and skill to inquire and pose questions which are to be solved is becoming a major educational objective.

Providing opportunities and training pupils to ask questions and basing instruction on this strategy may have a great impact on pupils' attitudes towards school and learning, on their motivation, and ability to search for the answers to unsolved problems. Furthermore, a lack of awareness to problems reduces opportunities for independent learning in the future. He who has no questions has no reason to learn when he is outside of school.

Klafky (1967) sees the challenges of teaching as follows: "How can I introduce the subject into the question horizon of the pupil? How can I make the pupil feel that his questions are worthwhile? How can I turn the subjec matter which was created as an answer back to a question?".

The recognition that pupil's questions are an important factor in thinking, in general, and in productive thinking, in particular, led us to the goal of training student-teachers to elicit questions from their pupils.

The study was carried out at the Gordon Teachers' College, in Haifa, Israel.

II - OBJECTIVES OF THE STUDY:

1) Identify teaching behavior which stimulates learners to ask questions, preferably of high-order;

2) Study the effectiveness of microteaching techniques in training student-teachers to stimulate learners to ask these questions;

3) study the effects of groups and individual supervision in achieving training goals in a microteaching situation;

4) study possible changes occurring in pupils' skills which specific teacher behaviors intend to improve.

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III - METHODS AND TECHNIQUES

A. Identification of teaching behavior intended to stimulate pupils' questions.

a) A list of teaching behaviors that might stimulate pupils to ask questions on given subjects was compiled after completing a survey of the literature and interviews with teachers, educators and students.

b) Fifteen student-teachers were instructed to choose a topic and teach it in micro-lessons with the intention of eliciting pupils' questions. However, they were not instructed as to which specific behaviors to utilize. Two independent raters counted the number of questions asked in the lessons. Those micro-lessons in which ten or more questions were asked in five minutes were chosen for further analysis in order to identify the specific teaching behavior which stimulated questions.

c) For further verification, five micro-lessons were then given with the intent of stimulating learners' questions; and five micro-lessons were presented with no such intent. All ten lessons were evaluated by two independent raters. Inter-rater correlation was high ($r = .85$). A significant statistical difference was found between the two sets of lessons, indicating that stimulation of questions is a teaching behavior which can be identified.

The dominant behaviors appearing in the lessons were compared with the behavior patterns identified in the survey and the two together provided a rating instrument which was based on a 1 - 5 scale, where "1" meant that the specific teaching behavior was not utilized and "5" meant that it was employed very successfully.

B. List of Teaching Behaviors included in the Rating Instrument

1. The teacher clarifies the purpose of the lesson.
2. The teacher gives examples of possible questions on a certain subject.
3. The teacher actively extracts responses by requesting the students to ask questions.
4. The teacher emphasizes or calls attention to controversies and contradictions in contents.
5. The teacher asks probing questions in order to clarify or extend areas of reference.

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6. The teacher gives hints to divergent possibilities for posing questions.
7. The teacher refers to and relates to pupils' questions and uses them as further stimulus.
8. The teacher stimulates the turning of statements into questions.
9. The teacher reinforces pupils' questions
10. The pupils ask many low-order questions.
11. The pupils ask many high-order questions.

The criteria for low or high order questions was based on the taxonomy of classroom questions suggested by Sanders (1966). According to his classification, low-order questions are considered those which request information and involve memory. High-order questions are considered those which ask for interpretation, application, analysis, synthesis and evaluation.

Categories 10 and 11 were added in the belief that improvement in any teaching behavior should have as a product an improvement in the expected pupils' behavior. There would be no benefit in trying to alter teaching behaviors which do not have any expected effect on the pupils.

C. The Sample.

Twenty student-teachers were divided into two equal groups according to their grades in academic subjects and practice teaching:

Group A-10 students received group supervision.
Group B-10 students received individual supervision.

D Hypotheses.

1. Training student teachers by microteaching techniques will significantly improve the teaching behaviors of group A and group B as measured by each one of the categories in the rating scale.
2. The improvement of group A will occur in more categories and will be more significant than that of group B, because of group pressure and imitation processes.

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3. All pupils participating in the micro-lessons will ask more questions at the conclusion of the student-teachers' training that at the outset of the training.
4. The pupils participating in the micro-lessons given by group A will ask more questions at the conclusion of the training than those participating in the micro-lessons presented by group B.

E. Procedures.

1. Lectures and discussions were presented to both groups stressing the importance of learners' questions as tools for fostering productive thinking and motivation. Suggestions on various possibilities and situations in which such questions may have an impact on planning instruction were also introduced.

2. The student teachers taught four micro-lessons each intended to stimulate learners' questions on various topics. Two lessons were on academic subjects (i.e. geography, history, literature, etc.) and the two remaining lessons were drawn from current events (i.e. politics, sports, theater, social problems, etc.). To prevent the order of lessons from influencing the results, five students in each group taught lessons based on academic subjects first, followed by lessons on general topics. The procedure was reversed in the case of the other five students. In using this method, we believe that there was no discrepency in the data due to preferences in subject matter or order of the lesson. We also altered the routine procedure usually employed by the micro-teaching method as follows: generally the trainee teaches the same subject each time to a different group of learners, but in this study the trainee taught varied subjects to the same group of learners. The procedure bears more resemblance to normal classroom procedure, in which the teacher teaches different topics to the same pupils. Such an alteration provides more accurate data since a student-teacher's proficiency in a given subject due to repetition may be influencing the stimulation of questions rather than the trainee's teaching behavior.

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The order of teaching was as follows:

GROUPS / LESSONS	G R O U P A		G R O U P B	
	Sub-group "a"	Sub-group "b"	Sub-group "a"	Sub-group "b"
First, Second	Same subject to different pupils	Same pupils, different subjects	Same subject to different pupils	Same pupils, different subjects
Third, Fourth	Same pupils, different subjects	Same subject to different pupils	Same pupils, different subjects	Same subject to different pupils

All lessons were given to seventh grade pupils at one particular school. Each pupil participated in four micro-lessons and the total teaching time was about 40 minutes in duration.

Seven to 15 minutes were allotted to each lesson and supervision followed it. Group A received group supervision, which was primarily focused on peer evaluation. The supervising teacher interfered only when necessary. Group B received individual supervision, that is only the trainee and supervisor were present. In each system of supervision the video tape recorder was used as a source of feedback. Supervision was followed by re-teach.

The first and last lessons were considered as pre- and post-test, respectively. The lessons were evaluated by two independent raters (inter-rater correlation was $r = .801$). Measurements of change between pre- and post test in each group were obtained by t-test procedure indicating a statistically significant change.

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IV - RESULTS.

Changes in Teaching Behaviors as Indicated by t-test Values Between Pre- and Posts-tests

GROUPS / CATEGORIES	GROUP A Values of t.	GROUP B Values of t.
1. Clarifies the purpose	-2.80**	0.89
2. Gives example of possible questions	1.00	0.67
3. Activates directly	-4.58***	1.65
4. Emphasizes controversies	-0.45	0.29
5. Asks probing questions	-2.62**	-2.25*
6. Gives hints to divergent possibilities	-1.58	-1.34
7. Refers and relates to pupils' questions	-4.03***	-2.32*
8. Stimulates the turning of statements into questions	-3.00**	-2.45*
9. Reinforces pupils' questions	-3.07**	1.35
10. Low-order questions asked by pupils	-2.70*	-2.25**
11. High-order questions asked by pupils	-2.90**	-2.47*

* $<$ p 0.05

** $<$ p 0.02

*** $<$ p 0.01

A general view of the table reveals that significant changes did occur in both groups. Thus the first hypothesis was confirmed.

A closer examination of the results reveals that in Group A, the trainees who received group supervision, changes occurred in 8 out of 11 possible categories; whereas in group B, which received individual supervision, changes occurred only in 5 out of 11 categories. This verifies the second hypothesis, in that group supervision was more effective than individual supervision.

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This latter result may be explained by the possibility that students learnt not only from the feedback received by self-confrontation and supervision, but also from the feedback and supervision received by their peers. The reinforcement of peer group behavior also served as a source of imitation. A similar view is expressed in the literature of Bandura and Walters (1963) in which it is revealed that complex social behavior can be acquired almost entirely through imitation.

The significant change shown by group A in the first category, that of clarifying the purpose, might have created changes in the remaining categories, since clear purposes lead to relevant and expected behaviors. An effective change in this group may also have occurred due to the factor of group supervision rather than individual supervision.

The second hypothesis was also proven correct in that improvements in Group A occurred not only in more categories, but were also more significant.

The third hypothesis was also confirmed. There was a significant change in the amount of questions asked by the pupils when pre-tests were compared with post-tests in both low and high order questions.

This change is the most important since it reveals that improvement in teaching behaviors influences pupils' reaction and the stimulation of pupils to ask questions leads to expected results. An additional proof that this rating scale may be utilized for stimulating learners' questions may be seen by the fact that the more improved the trainee's behavior became, the more questions the pupils asked.

The fourth hypothesis, namely that pupils participating in Group A's lessons will ask more questions, was only slightly verified. No difference was found between the amount of low-order questions asked by the pupils of both groups, but in asking high-order questions, Group A's pupils showed a significant growth level of $p < 0.02$, whereas Group B's pupils' growth level was $p < 0.05$.

The significant change in the amount of questions asked by all pupils after the short training period (40 minutes) may have been due to the fact that their initial behavior in this respect was very poor, since they were not

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presented with such a stimulus before. We may assume that further training will not have such a great impact. However, a follow-up study of these pupils compared with a control group proved that after a period of eight months, these same pupils were still significantly superior in this respect.

V - SUMMARY AND IMPLICATIONS

This study was initiated under the assumption that there is a great need for the improvement of classroom instruction in general, and in particular, for the improvement of teaching behavior which stimulates the thought processes of learners. To achieve this, methods and techniques of relevant teacher training are needed.

Microteaching was the technique chosen for this purpose because of its advantages in alleviating certain deficiencies which are present in tradional teacher-training programs. The specific teaching behavior chosen for training by microteaching techniques was the stimulation of learners' questions as a tool for improving thinking processes and independent learning.

The general purpose was to identify teaching behaviors which stimulate pupils to ask questions and to test the efficiency of microteaching techniques in improving these particular teaching behaviors.

A secondary objective was to test the efficiency of group supervision versus individual supervision.

The results of the study present the following contributions to teaching and teacher training:

1. A specific teaching behavior, which we considered important, was identified and translated into behavioral categories. Preparing student-teachers to use such behavior may have an impact on teaching and instruction in the future.
2. As a method of training, microteaching was found to be effective in changing student-teacher behaviors.
3. Since group supervision was found to be more effective than individual supervision, teacher training institutions may be willing to employ this procedure. Further advantages such as the time-saving factor and the improvement of group processes may be investigated by the teacher training

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institutions. The latter is valuable, in itself, as an indirect preparation for future teamwork and the development of a more democratic climate in classroom interaction. However, further studies involving Aptitude Interaction Treatment must be made in order to sustain more valid results.

March, 1972.

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